Space Network (SN)
Web Services Interface (SWSI)
Release 04.1

Operations Readiness Review

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GSFC Code 565/452

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ORR Review Board

- **Allen Levine - Code 451/NASA (Chair)**
- **Caren Gioannini - Code 452/565/WSC**
- **Bob Traversy – Code 452/WSC**
- **Doug Spiegel – Omitron/SWIFT**
- **Stan Rubin - Code 291/NASA**

Background

- The primary function of SWSI is to provide a secure network-based Graphical User Interface (GUI) to the Network Control Center (NCC) Data System (NCCDS) and to the Demand Access System (DAS) to perform SN customer scheduling, real-time service monitoring and control, and state vector storage.
- Access from the Internet and NASA Integrated Services Network (NISN) Open & Closed Internet Protocol (IP) Operational Network (IONet)
- Secure access through encryption, certification, and authentication
- Cross-platform compatible client application
- Java-based GUI
- Supports full NCCDS/Mission Operations Center (MOC) interface, including flexible scheduling
- Ability to transmit customer state vectors to SN
- Orbiting or stationary state vector generation based on user input of geocentric (position & velocity) or geodetic (latitude, longitude, & altitude) coordinates

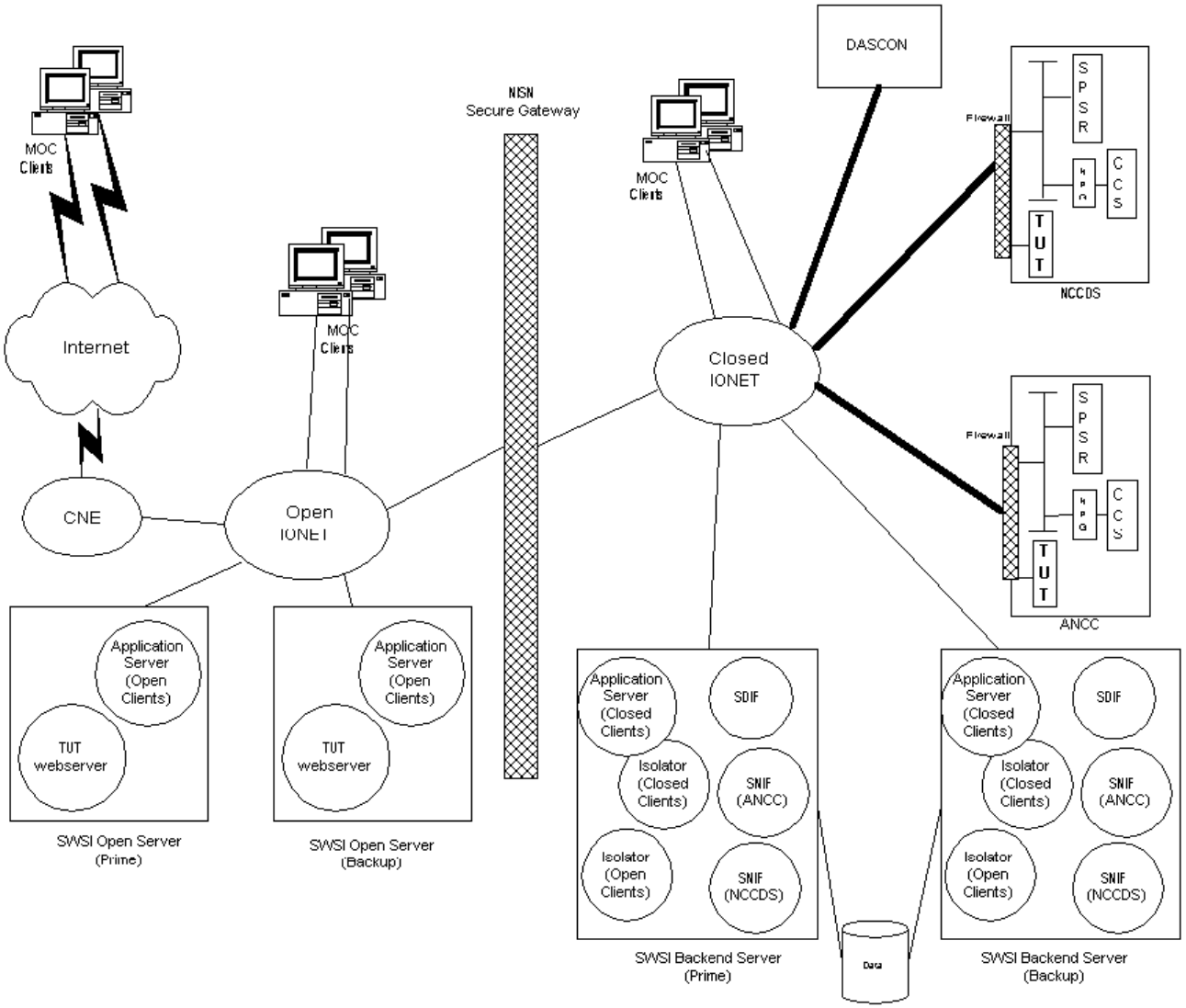
Background (Cont'd)

- **Internet and Open IONet access to TDRSS Unscheduled Time (TUT)**
- **Test mode for performing Engineering Interface (EIF) testing and user training**
- **Minimal user requirements – Windows or Unix workstation with Java Virtual Machine (freeware), web browser, and network access**

Background (Cont'd)

- **SWSI development began in April 2000 as in-house project with CSOC support under SODA GD44.**
- **CSOC support ended on December 31, 2003.**
- **NENS support began January 1, 2004.**
- **SWSI ORR 03.1 was the Initial Release providing management of SN Legacy Services. (Declared operational on July 21, 2003)**
- **SWSI ORR 04.1 is the Final Release providing management of SN Demand Access Services.**

SWSI Architecture



Hardware Components

- **Client Workstation**
  - User's desktop workstation, which can be any desktop that supports Sun Microsystems' Java Virtual Machine (JVM) 1.4.1.

- **Backend Server**
  - Hosts most of SWSI server applications
  - Manages user login sessions, database storage, and communications with NCCDS, ANCC, and DAS
- **Open Server**
  - Proxy server to allow Open IONet and Internet-based customers to connect to SWSI and access TUT
  - Requests directed to Backend Server through NISN Secure Gateway
    - This allows the addition of new customers and users without the need for adding new Secure Gateway rules.

Hardware Components (Cont'd)

- **Two Backend Servers**
  - Two Sun Microsystems Blade 1000 desktop workstations
  - 21" color monitor
  - 36 GB internal SCSI disk drive
  - 4 mm 20 GB DDS-4 tape drive
  - Built-in 10/100 Mbps NIC
  - Quad 10/100 Mbps expansion NIC
  - High Availability (HA) configuration using dual heartbeats
- **RAID Array**
  - Sun Microsystems 72 GB Storage A1000 External RAID Array Level 5
  - Hot-swap components (drives, power supplies, fans)
  - Database storage only
- **Two Open Servers**
  - Two Sun Microsystems Ultra 2 desktop workstations
  - 21" color monitor
  - 9 GB internal SCSI disk drive
  - External 4 mm 12 GB DDS-3 tape drive
  - Built-in 10/100 Mbps NIC
  - Quad 10/100 Mbps expansion NIC
  - High Availability (HA) configuration using dual heartbeats

Software Components

- **Client**
  - Executes on customer's workstation
  - Provides Graphical User Interface (GUI) for performing SWSI client operations
- **Application Server**
  - Server process that Client connects to for accessing SWSI services
  - Tracks requests and provides responses to the Client
  - Separate instances run on Open and Backend Servers
- **Isolator**
  - Server process provides interface for Client with SWSI Database
  - Processes requests and generates responses
  - Communicates with Client through Application Server
  - Separate Isolator required for each Application Server

Software Components (Cont'd)

- **SWSI-NCCDS Interface (SNIF)**
  - Server process that communicates with NCCDS using NCCDS/MOC messaging protocol
  - Separate SNIF required for each NCC (operations NCC and ANCC)
- **SWSI-DAS Interface (SDIF)**
  - Server process that communicates with DAS using DAS/SWSI messaging protocol
  - New subsystem added for the Final Release (04.1)
- **Database**
  - Backend data storage for customer configuration and scheduling data
- **Open TUT Server**
  - Web server mirrors TUT services provided by NCCDS on Closed IONet
  - TUT data updated hourly

Hardware Status

- **EC 8303 to install Sun hardware approved at WSC CCB on 01/08/2003**
- **Fully redundant servers with automatic failover**
  - Minimal operator intervention required
- **No Line Replaceable Units (LRUs) or spare parts.**
- **All Sun hardware covered under GSFC-initiated Sun maintenance contract.**
  - Currently platinum, (mission critical, 24x7), two hour response time
  - WSC Operations Supervisor authorized to make service calls
- **No changes to current hardware as a result of 04.1 delivery**

Software Status

- **Five Patches delivered to Integration &Test (I&T) since ORR 03.1 on 07/10/2003**
  - Build 5 Patch 01 installed 09/05/2003
    - 98 Bug Fixes
  - Build 5 Patch 02 installed 09/18/2003
    - 18 Bug Fixes
  - Build 5 Patch 03 installed 11/05/2003
    - 5 Bug Fixes
  - Build 5 Patch 04 installed 12/01/2003
    - 14 Bug Fixes
  - Build 5 Patch 05 installed 12/31/2003
    - 4 Bug Fixes
- **Baselines 03.1 and 04.1 have been merged.**
- **Formal 04.1 Acceptance Test started with Build 5 Patch 05 on 01/15/2004.**
- **Formal 04.1 Acceptance Test completed on 02/02/2004.**

Software Status (Cont'd)

- **No patches delivered since Acceptance Test completion 02/02/2004.**
- **Six minor bugs† found during Acceptance Testing.**
- **After successful ORR, the final software release 04.1 will be installed into operation by 02/27/2004.**

† **Status of bugs will be presented during the Verification Results**

Software Status (Cont'd)

- **Open Bugs relative to SDIF**
  - Bug #950 SDIF SIC validation
    - Unresolved – Will be investigated after SWSI 04.1 is declared operational
  - Bug #951 Completion of SDIF logging redesign
    - Unresolved - Will be investigated after SWSI 04.1 is declared operational
  - Bug #953 SDIF State Vector transmission alerts
    - Unresolved - Will be investigated after SWSI 04.1 is declared operational
  - Bug #958 SDIF ConfigurableAlertMessage sometimes doesn't work
    - Unresolved - Will be investigated after SWSI 04.1 is declared operational
  - Bug #978 Send DAS GCMR Causes Uncaught Exception in SDIF
    - Unresolved - Will be investigated after SWSI 04.1 is declared operational
  - Bug #991 - DAS Connection status on SWSI main panel is not always accurate
  - Bug #992 - DASUPDPrimaryExpirationTime only triggers after first UPD dropout
  - Other open bugs are minor Client usability issues or enhancements.
- **Software maintenance will be responsibility of NENS.**

Verification Results

- **Acceptance testing was conducted by NENS Systems Engineering from 01/15/2004 – 02/02/2004.**
- **Build 5 Patch 05 was the baseline tested during acceptance testing.**
- **The testing approach focused on validation of SWSI-DAS requirements with regression testing of SWSI-NCCDS functionality.**
- **In all, 21 test procedures were executed.**
  - 20 SWSI-DAS
  - 1 SWSI-NCC
- **All test procedures were successfully completed with the exception of test procedure 3.20 which was only partially completed due to the test environment configuration. Plan is to complete this test procedure during transition.**
  - Server failover functionality will be verified during the release 04.1 delivery process
- **6 bug reports were documented during acceptance testing.**
  - 4 are 'Resolved'
  - 2 remain 'Open'
    - Bugs #991 DAS Connection status on SWSI main panel is not always accurate
    - Bugs #992 DASUPDPrimaryExpirationTime only triggers after first UPD dropout

Performance Verification Matrix Summary

- **The PVM is a tool for tracking the verification of requirements documented in the SWSI System Requirements Document (SRD)**
- **Three types of requirements are identified in the PVM:**
  - General requirements:
    - Requirements that are not specifically applicable to either the NCCDS or the DAS functionalities (e.g., installation requirements, security requirements, database management requirements, etc.).
    - General requirements were verified prior to the Release 03.1 ORR (not applicable for this ORR).
  - NCCDS requirements:
    - Requirements that specifically relate to the SWSI capability to support the SN customer-NCCDS interface.
    - NCCDS requirements were verified prior to the Release 03.1 ORR (not applicable for this ORR).
  - DAS requirements:
    - Requirements that specifically relate to the SWSI capability to support the SN customer-DAS interface.
    - Verification of DAS requirements is applicable to the Release 04.1 ORR.

PVM Requirement Verification Allocation

- **There are a total of 191 SWSI SRD requirements tracked in the PVM.**
  - A “PVM requirement” is defined by a SWSI SRD paragraph containing a contractually-binding “shall” statement.
  - Requirement breakout by type:
    - 89 General requirements.
    - 76 NCCDS requirements.
    - 26 DAS requirements.
- **Original SWSI PVM requirement verification allocation:**
  - 91 requirements allocated to SWSI testing.
  - 23 requirements allocated to DAS qualification testing.
  - 25 requirements allocated to Demonstration (e.g., data management, etc.).
  - 46 requirements allocated to Inspection of SWSI documentation (e.g., SWSI Server Operator’s Manual, SWSI training material, etc.).
  - 6 requirements allocated to Analysis (e.g., RMA, etc.).
- **6 SWSI requirements originally allocated to DAS qualification testing were not verified by that testing.**
  - The 6 SWSI requirements were re-allocated to SWSI testing in September 2003.
  - All 6 SWSI requirements were completed by SWSI testing in February 2004.

PVM Requirement Verification Status

- **Total SWSI SRD Requirements: 191**

- **Total Requirements for Release 03.1: 165**
- **Total Release 03.1 Requirements Verified: 152**
- **Total Release 03.1 Requirements Waived: 13**

- **Total Requirements for Release 04.1: 26**
- **Total Release 04.1 Requirements Verified: 26**

Security Status

- **Security Plan/Risk Assessment reviewed and accepted by IONet Security on 06/19/2000**
- **Security Plan/Risk Assessment revised and updated to reflect operational status on 07/10/2003**
- **Authorization to Process signed on 07/10/2003**
- **Rules of Behavior distributed to SWSI customers on 06/16/2003. Last updated 01/28/2004**
- **No security waivers**
- **No outstanding security issues**
- **Successful quarterly IONet Security scan conducted in January 2004**
  - Operational Servers
  - I&T Servers
  - Development Server

Operational Procedures

- **WSC Procedures**
  - WSC Ops support personnel have developed Operational Support Procedures
  - SWSI Client Software User's Guide and SWSI Server Operator's Guide are the source of information for procedure development.
- **Procedures to be Utilized by Operations Personnel:**
  - Client operation
  - System operation
  - Database Administration
  - System Administration
- **Client Software User's Guide and Server Operator's Guide**
  - Updated to reflect DAS capabilities
  - Posted to SWSI Website
  - Changes don't impact exiting legacy service customers

Training Status

- **Server training onsite at WSC performed June 23-27, 2003**
  - Client operation
  - System operation
  - Database administration
  - System administration
- **Client user (customer) training class available through Certification & Training Group (CCTG) at Goddard**
  - Course 885, SWSI Operations Overview

Customer Status

- **Missions currently configured for operations**
  - C/NOFS (not operational)
  - ELV's (Sea Launch, Atlas, Titan and Delta)
  - EO-1
  - FUSE
  - GALEX
  - GP-B (not operational)
  - Landsat-7 (backup operations only)
  - LDBP
  - MTRS-2
  - SORCE
  - SWIFT (not operational)
- **Missions currently configured for interface testing**
  - C/NOFS
  - EO-1
  - FUSE
  - GALEX
  - GP-B
  - ISS
  - Landsat-7
  - SWIFT
  - Topex

Documentation Status

- **Documentation online at http://swsi.gsfc.nasa.gov**
- **Completed Documents**
  - SWSI System Requirements Document (SRD)
  - SWSI Security Plan/Risk Assessment
  - SWSI-DAS Test Plan
  - Acceptance Test Results
  - Performance Verification Matrix
  - NCCDS Master Test Plan Addendum
- **Documents final pending CCB approval**
  - SWSI User's Guide, 452-UG-SWSI, DCN 1
  - SWSI Server Operator's Guide, 452-SOG-SWSI, DCN 1

Transition

- **New Release Delivery**
  - Transition timeline is in place.
  - Highlights
    - Issue Network Advisory Message (NAM)
    - SWSI downtime 8 to 10 hours
    - WSC OPS will provide manually support
    - Customer Coordination
      - » Customers need to upgrade to Release 04.1.
    - Post delivery support plan is in place
  - Transition Challenges
    - Failover Test
    - Back out of delivery could take time
- **Sustaining Engineering**
  - A draft plan is in place to address the transition of sustaining engineering to NENS.
  - The plan addresses software and hardware sustaining engineering, documentation, security, configuration management, training, licensing, and change management.
  - Highlights
    - SWSI I&T environment will remain at GSFC.
    - SWSI will fall under the purview of the SERB.
    - CDS will be used as the discrepancy management system.

Recommendation

- **We recommend that the SWSI product transition into SN operations.**

Summary

- **Review and assignment of Action Items**
  - RFA Form available on Documentation page at **http://swsi.gsfc.nasa.gov/**
  - Submit RFAs to the ORR Chairperson only.
  - RFAs due by 11AM EST, February 17th
- **Review Board assessment**
- **Closing remarks**

SDIF-Related Open Bugs

Bug	Severity	Summary	User Impact	Workaround
950	Normal	SDIF does not check whether a SIC is DAS compatible before processing a message. Affects SDIF inbound (from DAS) messages	None – affects SWSI backend server	DAS database and SWSI database need to be in synch in terms of which SICs are supported.
951	Normal	Completion of SDIF logging redesign	None – this is an enhancement to the server logging function	N/A
953	Normal	Alerts related to SDIF vector transmissions are different from alerts related to SNIF vector transmissions	Minor	N/A
958	Normal	SDIF ConfigurableAlertMessage sometimes doesn't work	None – affects a development utility	N/A
978	Normal	GCMR Causes Uncaught Exception in SDIF. User is not notified of the status of aGCMR	Minor –applies to 'No Change' GCMR's only	None
991	Minor	DAS Connection Status Is Not Consistent	Minor - DAS connection status may not be accurate. Problem was intermittent during testing.	Check alerts to see if DAS connection is down. If 'up' SWSI will function normally. If 'down' will receive failure alerts
992	Minor	DASUPDPrimaryExpirationTime only triggers after first UPD dropout	Minor - UPD status on UPD display will not show true status after first dropout	UPD staleness can be determined from time tag on UPD display